On the Orbit of γ Coronæ Australis. By J. E. Gore.

Recent measures of the position-angle of this well-known southern binary star show clearly that the distance is now slowly but steadily increasing, and that the period will prove to be considerably longer than has been hitherto supposed. I find that the period given in my paper in the *Monthly Notices* for January 1886 is much too short, and the elements there given do not represent recent measures satisfactorily either in angle or distance. I have therefore re-computed the orbit by the Glasenapp-Kowalsky method, using all available measures, and now find the following provisional elements :—

Elements of γ Coronæ Australis.

P = 154·41 years	$\Omega = 77^\circ\ 14'$
T = 1876·84	λ = 175 17
$e = 0{\cdot}4244$	$a = 2''{\cdot}55$
$i = 35^\circ\ 35\frac{1}{2}'$	$\mu = -2^\circ{\cdot}3314$

The following is a comparison between the measures and the positions computed from the above elements :—

Epoch.	Observer.	θ_o	θ_c	$\theta_o - \theta_c$	ρ_o	ρ_c	$\rho_o - \rho_c$
		°	°	°	″	″	″
1834·47	Sir J. Herschel	37·1	38·0	−0·9	...	2·81	...
1835·55	,,	36·8	36·4	+0·4	...	2·77	...
1836·43	,,	34·5	35·1	−0·6	...	2·73	...
1837·43	,,	32·7	33·6	−0·9	2·66	2·68	−0·02
1847·32	Jacob	14·1	15·0	−0·9	2·30	2·20	+0·10
1850·46	,,	5·9	7·2	−1·3	2·29	2·05	+0·24
1851·54	,,	4·5	4·4	+0·1	2·26	1·99	+0·27
1852·49	,,	2·2	1·6	+0·6	1·9	1·95	−0·05
1853·52	,,	359·0	358·5	+0·5	1·83	1·90	−0·07
1854·26	,,	356·2	356·2	0·0	1·71	1·87	−0·16
1856·44	,,	349·4	348·8	+0·6	1·67	1·78	−0·11
1857·44	,,	347·4	345·2	+2·2	1·61	1·74	−0·13
1858·20	,,	343·4	342·4	+1·0	1·53	1·71	−0·18
1859·72	Powell	338·1	336·4	+1·7	1½ est.	1·66	...
1861·69	,,	328·8	328·1	+0·7	...	1·60	...
1862·27	,,	325·5	325·6	−0·1	1½ est.	1·58	...
1863·84	,,	318·1	318·3	−0·2	...	1·56	...
1870·19	,,	286·9	287·4	−0·5	.	1·47	...
1875·65	Schiaparelli	257·4	259·6	−2·2	1·45	1·46	−0·01

Epoch.	Observer.	θ_o	θ_c	$\theta_o-\theta_c$	ρ_o	ρ_c	$\rho_o-\rho_c$
		°	°	°	″	″	″
1876·65	Howe	253·1	254·4	−1·3	1·67	1·46	+0·21
1877·43	Schiaparelli	248·4	250·4	−2·0	1·49	1·46	+0·03
1877·61	Howe	245·7	249·4	−3·7	1·37	1·46	−0·09
1877·69	O. Stone	249·4	249·0	+0·4	....	1·46	...
1878·49	„	242·4	244·8	−2·4	1·22	1·45	−0·23
1878·49	Howe	242·9	244·8	−1·9	1·47	1·45	+0·02
1879·69	Burnham	240·0	238·4	+1·6	0·87	1·44	−0·57
1880·46	Russell	233·1	234·3	−1·2	1·15	1·44	−0·29
1880·67	Hargrave	232·4	233·2	−0·8	1·32	1·44	−0·12
1881·72	O. Stone	225·5	227·6	−2·1	1·38	1·44	−0·06
1883·62	Wilson	217·7	217·4	+0·3	1·62	1·44	+0·18
1886·586	Pollock	200·3	201·5	−1·2	1·34	1·46	−0·12
1886·704	Russell	203·5	200·9	+2·6	1·52	1·46	+0·06
1886·705	Pollock	201·3	200·9	+0·4	1·68	1·46	+0·22
1887·689	„	196·6	195·8	+0·8	1·16	1·48	−0·32
1887·715	Tebbutt	196·7	195·7	+1·0	1·68	1·48	+0·20
1887·767	„	194·7	195·4	−0·7	...	1·48	...
1888·307	„	192·4	192·6	−0·2	1·59	1·49	+0·10
1888·637	„	187·9	190·9	−3·0	1·77	1·49	+0·28
1888·707	Leavenworth	188·0	190·6	−2·6	1·2	1·49	−0·29
1888·805	Tebbutt	191·9	190·1	+1·8	...	1·49	...
1889·41	Burnham	185·4	187·1	−1·7	1·79	1·50	+0·29
1889·843	Tebbutt	185·4	184·9	+0·5	...	1·51	...
1890·531	„	...	181·7	...	1·62	1·54	+0·08
1890·542	„	184·2	181·6	+2·6	...	1·54	...
1890·575	„	...	181·5	...	1·635	1·54	+0·095
1890·709	„	180·7	180·9	−0·2	1·54	1·54	0·0
1891·635	„	180·1	176·5	+3·6	1·57	1·57	0·0
1891·673	„	176·7	176·3	+0·4	...	1·57	...
1891·742	„	...	176·0	...	1·52	1·57	−0·05
1891·749	„	175·4	176·0	−0·6	...	1·57	...

According to the above orbit, the distance between the components will increase continuously during the next sixty years up to a maximum of about 3″·6.

Assuming that the mass of the system is equal to the mass of the Sun, the "hypothetical parallax" would be

$$p=\frac{a}{P^{\frac{2}{3}}}=0''\cdot088.$$

On the Orbit of γ Centauri. By J. E. Gore.

The measures of this southern binary star appear at first sight rather discordant. A closer examination, however, shows that the companion is revolving in a very elongated apparent ellipse, the real orbit being not only highly inclined to the line of sight but having a considerable eccentricity. I find that a complete revolution has been nearly performed since the star was measured by Sir John Herschel at the Cape in the years 1835 and 1836. Herschel's measures are somewhat discordant, ranging from 346·8 to 361·97; but measures in recent years show that if the position-angle was anything near 360° in 1835 and 1836, the distance between the components would have been nearly 2″, and they would have been easily divided with the 5-inch refractor used by Herschel. He estimated the distance, however, at only 0″·75, and says in the notes to his measures, "At least as close as γ *Virginis*; 273 barely elongates it . . . far too difficult for this telescope . . . excessively close and difficult." These remarks show that the distance could not have been anything like 2″ when Herschel measured it, and hence the position-angle must have been less than 360°, the motion being retrograde and not direct as Herschel supposed.

I have computed the orbit by the Glasenapp-Kowalsky method, and find the following provisional elements:—

Elements of γ Centauri.

P = 61·88 years	$\Omega = 177^\circ\ 57'$
T = 1840·84	$\lambda = 46\ 49$
$e = 0{\cdot}6316$	$a = 1''{\cdot}50$
$i = 84^\circ\ 6'$	$\mu = -5^\circ{\cdot}817$

P and T have been deduced from Herschel's measure at the epoch 1835·89, and Pollock's in 1889·323. The measures from 1856 to 1889 give a period of 62·68 years, and T = 1840·22, a close agreement.

The following is a comparison between the measures and the positions computed from the above elements:—

Epoch.	Observer.	θ_o	θ_c	$\theta_o - \theta_c$	ρ_o	ρ_c	$\rho_o - \rho_c$
1835·32	Sir J. Herschel	351°·6	355°·4	−3°·4	″ ...	″ 0·98	″ ...
1835·89	,,	354·3	354·3	0·0	0·75	0·87	−0·1
1836·38	,,	357·3	353·5	+3·8	...	0·78	...
1856·20	Jacob	20·6	22·3	−1·7	0·7 est.	0·48	+0·22
1857·973	,,	13·71	16·37	−2·66	1·11	0·65	+0·46
1860·684	Powell	12·8	11·5	+1·3	...	0·89	...
1870·233	,,	6·9	4·8	+2·1	1·5 est.	1·59	−0·09